PATENT CLAIMS

1. System for monitoring the performance of DWDM multi-wavelength systems, characterized in that a narrow-band and tunable low-pass filter (1) for the DWDM range is provided in a purely electronic form based on the principle of opto-electronic mixing in the form of a cross correlator (2).

2. System according to Claim 1, characterized in that the grating (24) in the form of a Littrow system both in the form of Ebert's array and in the form of an array according to Fastie is disposed for the multiple passage.

3. System according to Claim 1 or 2, characterized in that a grating is provided which is a ruled grating for avoiding polarization-dependent reflections, and which ensures an almost orthogonal incidence on said grating (24).

4. System according to the Claims 1 to 3, characterized in that a dielectric preliminary filter (22) is provided for suppressing wave lengths beyond the working range, which, due to the multiple passage, multiplies its efficient quality.

5. System according to Claim 4, characterized in that said grating (24) is provided for both a rotational movement and a periodically oscillating movement for wave length adjustment.

6. System according to Claim 5, characterized in that the combination of a moved grating (24) with an optical position sensor (28) is provided.

7. System according to the Claims 1 to 6,
characterized by a secondary laser (41) for scanning the moving object in order to derive a synchronizing signal for wave length assignment of the output signal of the system.

8. System according to the Claims 1 to 8,
characterized by a position sensor (28) for deriving a position signal (8) of the moving object.

9. System according to the Claims 1 to 8,
characterized in that said position sensor (28) consists of a line-shaped photodiode (46) with an incremental scale (45) disposed in front of it.

10. System according to Claim 1,
characterized in that for optically mixing two optical signals for the generation of a working signal, a non-linear opto-electronic component (30) is provided.

11. System according to Claim 1 or 10,
characterized in that said non-linear opto-electronic component (30) is a photodiode (32).

12. System according to Claim 1, 10 or 11,
characterized in that said photodiode (32) is provided for being directly irradiated from both light sources (39, 40) for combining the optical signals.

13. System according to Claim 1, 10 or 11,
characterized by a bulk or fiber optical Y-type coupler (48) for combining the optical signals.

14. System according to Claim 1 or Claims 10 to 13, characterized in that said electronic mixed signal is within the range of the low-frequency band.

15. System according to Claim 10 or Claims 10 to 14, characterized by a signal processor (35) for processing, rectification and further analysis of the low-frequency useful signal.

16. System according to Claim 1 or Claims 10 to 15, characterized by a tunable laser (38) for generating the reference radiation.

17. System according to Claim 1 or Claims 10 to 16, characterized in that said tunable laser (38) is a diode laser or a fiber laser.

18. System according to Claim 1 or Claims 10 to 17, characterized by a laser (38) that is commutable in increments and finely tunable within each segmental range for generating said reference radiation.

19. Method of monitoring the performance of DWDM multi-wavelength systems, characterized in that a system according to Claims 1 to 18 is applied.

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List of the Figures

Fig. 1 shows the fundamental structure of a narrow-band optical band-pass filter consisting of a grating spectrometer and an analyzer unit

Fig. 2 illustrates the principle of the opto-electronic cross correlator

Fig. 3 shows the principle of the grating spectrometer with multiple passages

Fig. 4 illustrates an example of the structure and the optical path in the grating spectrometer with multiple passages

Fig. 5 shows the structure of the position sensor

Fig. 6 illustrates an example of an opto-electronic cross correlator

Fig. 7 illustrates the beam combination by means of fiber couplers

Fig. 8 is a view of a dual-channel opto-electronic cross correlator

Legend of the Figures

1	grating spectrometer
2	opto-electronic cross correlator
3	analyzer
4	reference oscillator, laser, reference laser
5	input signal, fiber optical waveguide, fiber input
6	low-pass filter
7	signal processor
8	position signal
9	reference unit
10	driving unit
11	photo detector, photodiode
12	grating drive
13	optical unit
14	display unit
15	mirror
16	mirror
17	mirror
18	mirror
19	mirror
20	mirror
21	mirror
22	mirror
23	dielectric preliminary filter, dielectric band-pass filter
24	grating
25	input, fiber input
26	output
27	collimator and camera mirror
28	position sensor
29	wave length calibrator
30	non-linear opto-electronic component
31	fiber input

32	detector, non-linear detector component, photodiode
33	low-pass filter
34	rectifier
35	signal processor
36	display unit
37	reference laser controller
38	tunable laser, reference laser
39	working beam
40	reference beam
41	secondary laser
42	optical system
43	grating
44	mirror
45	incremental scale
46	detector, line-shaped photodiode
47	polarizer
48	bulk or Y-type fiber coupler
49	polarizing beam splitter